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BEFORE THE ARIZONA CORPORATION COMMISSION

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Commissioner

AZ CORP COMMISSION
DOCUMENT CONTROL

IN THE MATTER OF INVESTIGATION
INTO QWEST CORPORATION'S
COMPLIANCE WITH CERTAIN
WHOLESALE PRICING REQUIREMENTS
FOR UNBUNDLED NETWORK ELEMENTS
AND RESALE DISCOUNTS.

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QWEST CORPORATION'S POST-HEARING BRIEF

Timothy Berg
Theresa Dwyer
FENNEMORE CRAIG
3003 North Central, Suite 2600
Phoenix, Arizona 85012

John Devaney
Norton Cutler
PERKINS COIE LLP
607 Fourteenth Street, N.W.
Suite 800
Washington, D.C. 20005-2011

Attorneys for Qwest Corporation

Arizona Corporation Commission

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INTRODUCTION

In this phase of the cost docket, the Commission must establish prices for local interconnection service switching, switching-related unbundled network elements ("UNEs"), unbundled packet switching ("UPS"), remote terminal collocation, and custom routing. Qwest Corporation's ("Qwest") cost studies establish the total element long-run incremental cost ("TELRIC") for each of these services and network elements. Consistent with the FCC's TELRIC principles, Qwest's studies estimate the costs to replace and operate the network *today* using the most efficient technology that is reasonably available *now*. Qwest's studies do not adopt historical costs or use the embedded network, except for assuming the existing locations of Qwest's switches, as expressly permitted by the FCC's TELRIC methodology.¹ The prices the Commission establishes should reflect the realistic costs that an efficient carrier will incur to provide the services and UNEs at issue and, to the extent possible, should be specific to Arizona.² Qwest's Switching Cost Model ("SCM") calculates the Arizona-specific TELRIC for each of the switching services and UNEs at issue, including local switching usage, line and trunk ports, and vertical features. The SCM includes the realistic costs an efficient carrier will incur to provide switching, including the costs associated with switch upgrades and line additions, and estimates end office rates of \$.0026 per minute of use ("MOU") and port rates of \$2.45 per month including features.

¹ In both phases of the docket, Qwest presented evidence of the historical costs it has incurred to provide network elements. The Commission should not view the submission of these costs as evidence that Qwest is advocating rates based on embedded costs. Instead, these costs are relevant to calculating TELRIC, but are not determinative of TELRIC. It would be unreasonable to ignore the real-world guidance provided by this recent history.

² See First Report and Order, *In the Matter of the Implementation of the Local Competition Provisions of the Telecommunications Act of 1996*, CC Docket Nos. 96-98 & 95-185, FCC 96-325 (rel. Ag. 6, 1996) ("*Local Competition Order*") at ¶ 685.

The Administrative Law Judges ("ALJs") should reconsider their recommendation that the HAI model, being sponsored by AT&T Communications, WorldCom, and XO Arizona ("Joint Intervenors"), be used to establish rates for the UNEs considered in Phase II. There are several fundamental shortcomings in the model's calculation of switching costs that render the switching module of the model unlawfully inconsistent with TELRIC and unfit for use by the Commission. The module incorporates certain erroneous inputs and assumptions that its proponents claim are justified by FCC decisions reflected in its Tenth Report and Order ("*Inputs Order*") in its Universal Service proceeding.³ But what those parties have neglected to inform the Commission is that the FCC has explicitly cautioned against using the switching inputs to calculate UNE prices in that very order, and has reiterated that caution in several recent orders issued pursuant to section 271 of the Telecommunications Act of 1996 ("the Act").⁴ The module also excludes the switching costs that an efficient facilities-based carrier in building and operating its replacement network, such as costs for replacing its network for upgrades to switches, features, and to add lines to account for the inevitable increase in customer demand. TELRIC provides for the replacement of the entire network over the long run, which must include the upgrades and growth lines used over the entire life of the switch, estimated by both Qwest and the HAI to be ten years.

³ Tenth Report and Order, *In the Matter of Federal-State Joint Board on Universal Service; Forward-Looking Mechanism for High Cost Support for Non-Rural LECs*, CC Docket Nos. 96-45 and 97-160, FCC 99-304 (rel. Nov. 2, 1999) ("*Inputs Order*").

⁴ See Memorandum and Opinion Order, *In the Matter of Application of Verizon New England Inc., Bell Atlantic Communications, Inc. (d/b/a Verizon Long Distance), NYNEX Long Distance Company (d/b/a Verizon Enterprise Solutions) And Verizon Global Networks Inc. for Authorization to Provide In-Region InterLATA Services in Massachusetts*, CC Docket No. 01-9, FCC 01-130 at ¶ 32 (rel. Apr. 16, 2001) ("*Verizon Massachusetts Order*"); Memorandum Opinion and Order, *In the Matter of Application by Bell Atlantic New York for Authorization Under Section 271 of the Communications Act to Provide In-Region, InterLATA Service in the State of New York*, CC Docket No. 99-295, FCC 99-404 at ¶ 245 (rel. Dec. 22, 1999) ("*Bell Atlantic/New York Order*").

Compounding these errors, the HAI model assumes that switches operate at an unrealistically high utilization rate of 96 percent with no spare capacity and no opportunity to increase capacity. This design provides only enough capacity for the first day of operation. If the adoptions in the HAI switching module were actually implemented in a replacement network, increased call blocking and busy signals and an overall level of poor service would be a certainty. At a minimum, there would be significant delays in providing service to customers and, in many cases, an inability to provide service at all. The network would be stagnant, with no new features or functionalities ever being available to wholesale or retail customers in Arizona. While HAI's assumptions, purportedly justified by the FCC's *Inputs Order*, considered alone, lead to a gross understatement of TELRIC switching costs, the model tries to have it both ways by rejecting other FCC inputs that recognize additional costs that an efficient carrier would incur. For example, the switching module incorporates a cost reduction, purportedly reflecting alleged savings achieved by deleting analog lines, that the FCC expressly rejected. Finally, both the HAI switching module and Commission Staff have excluded most of the cost of the applications software necessary to provide the switch features that the Joint Intervenors have demanded. Excluding the cost of the license fees for this software is tantamount to running a PC program, like Word, without paying Microsoft. TELRIC requires that if CLECs receive these features, the costs of providing them must be included in the rates they pay.

As a result of the numerous unrealistic assumptions it uses, the HAI switching module produces only about 60 percent of the total Qwest, forward-looking switching investment in Arizona based on prices available for switching today, as evidenced by the prices Qwest currently pays to its switch vendors. The most recent Qwest contracts for switching equipment, which are the best evidence of the cost of switching today, yields an investment of approximately \$157 per line versus the Hatfield estimate of approximately \$90 per line. At a minimum, this gross disparity between Qwest's investment and the HAI estimate strongly suggests that something is wrong with the HAI model. As this comparison suggests, the HAI switching

module lowers costs at every turn, resulting in a switching network that would unquestionably lead to inferior, unacceptable service.

The SCM provides far more reliable estimates of the Arizona-specific TELRIC costs for switching. It does so by developing forward-looking investment for every switch location in Arizona while recognizing that switch upgrades and line additions are a real-world cost incurred by efficient carriers in building *and operating* a switching network. The Commission should rely on SCM for the switching rates it orders in this docket. The current Qwest proposed rates fall within the range of the rates approved in other states that have received section 271 approval, as shown in Exhibit B. For example, the rates for local switching include \$.002666 from Oklahoma and .003512 from New York. In contrast, the .00121 proposed by the Joint Intervenors falls below even the rate of .001438 in Texas -- the state with section 271 approval that has the lowest rate. These comparisons confirm that AT&T's proposed rates do not comply with TELRIC.

If the Commission decides, however, to use the HAI model despite the substantial flaws in the switching module, it should require significant adjustments to the HAI model. At a minimum, the adjustments should include additional investment to account for the costs of:

- switch upgrades,
- increased processor capacity for line growth,
- realistic fill factors at a level of 80 percent,
- billing based on the number of minutes used that a call is connected,
- application software used for features, and
- the model's improper use of the analog line offset.

These adjustments will raise the HAI switching module MOU rate from 00121 per minute to 00221 and the recurring port rate from .90 to 1.96 per month. *See Ex. A.*

Qwest's proposed nonrecurring rates for installing switch ports are also consistent with TELRIC. These rates reflect a reduction from the existing rates, which were developed by a prior version of the HAI model and were affirmed as being consistent with TELRIC by the

United States District Court for Arizona.⁵ Qwest's proposed nonrecurring rates for ports include a flow-through rate of approximately 60 percent for operational support systems ("OSSs") and the manual activity required to design a circuit, run jumpers, and test installed circuits. Thus, the Commission should adopt the SCM rates, which range from \$123 to \$227.50. rather than the Joint Intervenor's proposed nonrecurring rate of \$1.69.

The next issued to be addressed is UPS.. Qwest's cost studies estimate the recurring and nonrecurring costs that Qwest will incur to provide each of the sub-elements that comprise UPS in the limited circumstances in which Qwest is required to offer this product. The studies rely on the efficient technology currently available to provide UPS.

The Commission must also address rates for remote terminal collocation. Qwest's studies relating to remote terminal collocation estimate the efficient recurring and nonrecurring costs that Qwest will incur for the required reserved space established in the SGAT. The nonrecurring study includes the materials and labor needed to provide collocation space and feeder/distribution interfaces ("FDIs"), and the recurring study includes the maintenance costs associated with the equipment for this element. Qwest's nonrecurring cost study for custom routing reflects the efficient costs associated with the tasks an efficient carrier must perform to establish this service for operator service and directory assistance. Joint Intervenor and the Staff have proposed modifications to the remote terminal collocation studies that fail to reflect the reasonably anticipated utilization of the facilities required by the SGAT at their request. Similarly, they have proposed the elimination of shared and common costs associated with custom routing that Qwest or any other efficient carrier clearly will incur to provide this product. The Commission should reject these proposed modifications, as they are inconsistent with TELRIC requirements.

⁵ See *U.S. West v. Jennings*, 46 F.Supp.2d 1004 (D.Ariz. 1999).

ARGUMENT

I. The Proper Definition and Application of TELRIC

The FCC recently explained that the “essential objective” of TELRIC “is to determine what it would cost, in today’s market, to replace the functions of [a network] asset that make it useful,” while simultaneously taking as given “the most basic geographical design of the existing network.”⁶ TELRIC asks what facilities would be “currently available” to an efficient carrier seeking to replace the existing network given the constraints of the rest of the world.⁷ The “current availability” of such facilities is integral to the basic purpose of TELRIC, which is to “replicate[], to the extent possible, the conditions of a competitive market.”⁸ By replicating those conditions, TELRIC is meant to give CLECs appropriate price signals about when it would be efficient, and when inefficient, to build their own facilities rather than leasing the incumbents’ existing capacity.⁹

The ultimate objective of the Act is true facilities-based competition. As the FCC recently observed, “[t]hrough its experience over the last five years in implementing the 1996 Act, the Commission has learned that only by encouraging competitive LECs to build their own facilities or migrate toward facilities-based entry will real and long-lasting competition take root in the local market.”¹⁰ These statements underscore the importance of setting UNE prices based on “currently available” technology and on realistic constructs that lead to prices that replicate

⁶ Brief for Petitioners FCC and United States, *Verizon Communications, Inc. v. FCC*, No. 00-511 and consolidated cases, (filed April 2001) (“FCC 2001 S. Ct. Br.”) at 6, 9.

⁷ 47 C.F.R. § 51.505(b)(1) (emphasis added).

⁸ *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, First Report and Order, 11 FCC Rcd 15499, 15846 ¶ 679 (1996) (“*Local Competition Order*”).

⁹ See *id.* at 15813 ¶ 620, 15848-49 ¶¶ 683-85.

¹⁰ *Deployment of Wireline Services Offering Advanced Telecommunications Capability*, Fourth Report and Order, 16 FCC Rcd 15435, 15437 ¶ 4 (2001); see also *Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers*, Notice of Proposed Rulemaking, CC Docket No. 01-339, et al., FCC 01-361, Separate Statement of Chairman Michael K. Powell at 2 (adopted Dec. 12, 2001) (stressing FCC’s “ongoing commitment to the promotion of facilities-based competition”).

conditions in a competitive market. Deviating from this approach will distort the price signals TELRIC is designed to send and will eliminate any incentive a CLEC might have to invest in facilities of its own. No carrier would ever build facilities if it could lease them at rates below the costs of the facilities.

To avoid this result, the Commission should be careful to apply TELRIC to each of the rate elements at issue in this docket in the way that the FCC intended it be applied – to establish cost-based prices that replicate prices in a competitive market rather than subsidize inefficient resale entry. As the FCC recently explained, TELRIC asks what facilities would be "currently available," 47 C.F.R. § 51.505(b)(1), to an efficient carrier seeking to replace the existing network given the constraints of the rest of the world. The "current availability" of such facilities is integral to the basic purpose of TELRIC, which is to "replicate[], to the extent possible, the conditions of a competitive market."¹¹ By replicating those conditions, TELRIC is meant to give CLECs appropriate price signals about when it would be efficient, and when inefficient, to build their own facilities rather than leasing the incumbents' existing capacity.¹²

Relatedly, the Commission should not confuse Qwest's reliance on its experience or historical costs as an embedded approach, as CLECs have urged. TELRIC allows the use of recent Qwest experience to predict the realistic efficient cost of replacing switches. Although historical costs are not conclusive proof of forward-looking costs, the United States Court of Appeals for the D.C. Circuit endorsed using ILEC historical costs as predictor of the efficient future in *AT&T v. FCC*, 220 F.3d 607, 617 (D.C. Cir. 2000). Indeed, the FCC in its brief stated:

If appellants are claiming that TELRIC precludes consideration of historical costs in calculating forward looking costs, they are wrong. Indeed, in the very universal service proceeding upon which appellants rely, the FCC itself used historical data to estimate forward looking costs.¹³

¹¹ *Local Competition Order* at ¶ 79.

¹² *Id.* at ¶¶ 683-85.

¹³ Brief of Appellee FCC at 17-18.

Thus, in applying TELRIC, the Commission should rely on Qwest's recent costs of purchasing switches, upgrades and software, not the nationwide average switching investment for *universal service funding* that is plugged into the HAI model to calculate *UNE costs*.

II. The Commission Should Adopt Qwest's Proposed Rates for Switching.

To plan a network that includes switching, an efficient carrier must determine the number of customers on each switch, the amount of calling the customers are anticipated to engage in, and the functions the customers likely will want over the life of the switch. These decisions are at the core of the major switching issues in this docket. The Commission needs to first select a model, then it must size the switch to ensure that it is capable of handling anticipated calling demand. This, in turn, requires determining the fill factor for the switch and the need to add lines over the life of the switch to accommodate growth. The anticipated uses of the switch will dictate the types of feature software, hardware, billing software and hardware, and upgrades to include in the switch. As Exhibit A demonstrates, that the inputs to the model relating to these major issues may have more importance than the model itself.

A. The Technology Involved In Switching.

To understand these issues, it is necessary to focus first on the technology used to provide switching in today's telecommunications network. The modern telecommunications switch is essentially a computer with a specialized application. While the size and complexity of a switch resembles that of a mainframe computer more than a personal computer ("PC"), switches in some respects resemble both types of computers. The switch is basically computer hardware that includes a processor, memory and storage devices, plugs in and out of the computer (ports), and wires that run to and from peripheral devices and other computers and networks. The switch, like a PC, has operating system software that runs the computer, just like Windows, Linux or Macintosh software runs most PCs. The switch, like a PC, also has application software that performs some of the call switching and provides all the features, such as call forwarding, call waiting, and voice mail.

If a PC user desires to increase the functionality and data handling capacity of a PC, it often becomes necessary to add hardware to the PC, such as a bigger processor chip, more memory, and more storage in optical disks. PC manufacturers often provide improvements in the operating system, such as Microsoft's recently released Windows XP. To perform new functions, manufacturers provide additional applications software or improve previous versions of the software, such as the upgrades that manufacturers have made to Word, Word Perfect, Excel, Quicken, and other programs. Changes in either the operating system or the application programs often require changes in the programs that run with both. For example, once a PC upgrades to Windows XP, it may require compatibility changes in all its application programs, such as Word and Excel. Similarly, a new version of Word might only run with the latest version of the operating system. Failure to make these upgrades on a timely basis soon renders the PC obsolete and unable to communicate with other PCs.

Switches too need periodic increases in hardware, such as memory, processors and storage devices to handle higher call volumes or to accommodate new software that provides more features. Over the last several years, switch manufacturers have introduced new functions through application software changes, such as sophisticated voice mail, wireless features, and call tracing devices to meet the requirements of federal law. These new features often have required a change in the operating system known as the "switch generics."

B. Defining the Switching Rate Elements

The rate elements for switching broadly fall into two categories: (1) local interconnection service; and (2) switching UNEs. Within the first category are end office call termination and tandem switched transport. Each one of these functions uses a certain amount of the switch for a very small period of time, and the SCM attempts to estimate the prorata cost for each of the appropriate rate elements. The end office call termination rate element is a usage-sensitive charge based on the minutes of use of a terminating end office switch to complete a local call to customers connected to that switch. The rate element for tandem switched transport is comprised of the sub-elements of tandem switching and tandem transmission. The tandem switching sub-

element is a per minute of use charge that applies when Qwest routes a call through a local tandem switch (which connects a series of end office switches) to complete a call. *See* Ex. C, attached hereto (illustration of tandem routing). The tandem transmission sub-element includes a fixed (*i.e.*, non-distance sensitive) per minute of use charge and a per minute, per mile charge for the transmission of traffic from a tandem switch to a terminating end office switch for completion of a call.¹⁴ The rates for these elements are found in Ex. D.

The switching UNEs also fall into two categories: (1) local tandem switching; and (2) local switching. The local tandem switching element encompasses the facilities that connect trunk distribution frames to a tandem switch and all the functions of the tandem switch itself. This rate element includes the facilities that establish a temporary transmission path between two switches, the routing of calls to operator services, and signaling conversion features. The recurring charges for local tandem switching include a DS1 (higher capacity gateway to the switch) local message trunk port, and use of local tandem switching billed on an originating per minute of use basis. The nonrecurring charges for this rate element include the charges associated with provisioning DS1 tandem trunk ports.¹⁵

The local switching category of UNEs includes line-side ports, trunk-side ports, and access to the features and functions of the switch. A line-side analog port is a two-wire interface on the line-side of an end office switch that extends to a main distribution frame ("MDF"). Qwest also offers digital line ports that provide 2-wire integrated voice and data capability. Qwest provides several types of trunk-side ports, including DS1 local message trunk ports, DS1 PRI ISDN trunk ports, and DS0 analog trunk ports (which go to other switches via trunks as opposed to the line side which goes to a frame connected to a customer). Each type of line-side and trunk-side port has recurring and nonrecurring charges associated with it. The recurring port

¹⁴ Ex. Qwest-11 (Malone Dir.) at 3.

¹⁵ Ex. Qwest-11 (Malone Dir.) at 4.

charges include the costs of vertical features, which are the application software capabilities built into an end office switch.¹⁶

C. Qwest's General Methodology for Estimating Switching Costs.

1. Recurring Costs

Recurring costs are the monthly charges associated with providing interconnection services and UNEs. Qwest estimates recurring costs for UNEs and interconnection services through its Integrated Cost Model ("ICM"), which Qwest described in detail in its post-hearing brief in Phase II.¹⁷

SCM is the switching module of ICM. It calculates efficient, realistic levels of investment by using the prices that switch manufacturers are charging today. SCM's investment calculations are specifically tailored to the characteristics of *each switch location in Arizona* and, consistent with the FCC's pricing rules, reflect the reasonably anticipated *Arizona-specific usage* of switching facilities.¹⁸ Accordingly, SCM's investment output reflects: (1) the number of switches that are needed to provide service in Arizona; (2) the number of lines associated with each switch in Arizona; (3) the average number of calls per line for each Arizona switch; (4) the CCS per line for each switch in the state; and (5) the reasonably anticipated rate of growth for each switch. These inputs have a direct affect on the design and size of the switches that SCM includes which, in turn, dictate the amount of investment the model includes. Because these inputs are specific to Arizona, the investment the model produces also is Arizona-specific. This approach is superior to the HAI model's use of the generic, nationwide switching investment from the FCC's *Inputs Order* developed for universal service purposes.¹⁹ Indeed, the Joint

¹⁶ Ex. Qwest-11 (Malone Dir) at 5-8.

¹⁷ See Qwest Post-Hearing Br. at 12-17.

¹⁸ Ex. Qwest-1 (Brigham Dir.) at 4.

¹⁹ Thus, the HAI switching module's use of the switching investment from the *Inputs Order* is inappropriate for two reasons. First, as explained below, the FCC has repeatedly observed that the inputs

Intervenor witness who sponsored the HAI model did not know whether any Arizona investment data were used to calculate the switching investment from the *Inputs Order*.²⁰

After developing the investment for switching, the cost analyst uses ICM to calculate investment-related capital costs (*i.e.*, depreciation, cost of money, income tax), operating expenses (*e.g.*, maintenance costs), and an allocation of common costs. In the final step of the process, the cost analyst compares the output of ICM with other cost data to ensure reasonableness. Qwest also compares its results across states and services and against cost results derived from other cost models.²¹ *See* Ex. B. In this case, as discussed above, the switching rates that ICM produces are within the range of the comparable rates in states where ILECs have received section 271 approval, such as New York and Oklahoma.

2. Nonrecurring Costs.

Nonrecurring costs are the one-time costs associated with establishing interconnection services or providing UNEs. These costs are typically caused by the specific activities that Qwest must perform in response to a CLEC request, such as taking and processing an order or physically connecting or activating a services or a UNE. Qwest calculates the nonrecurring TELRIC for UNEs and interconnection services through its Enhanced Nonrecurring cost studies ("ENRC"). The ENRC employs the following five-step process to calculate nonrecurring rates.

First, a cost analyst, working with a product team, identifies all activities necessary to establish a particular service or network element.²² Second, based on special studies and input from subject matter experts ("SMEs") who have actual experience performing the activities, the cost analyst estimates the work time associated with each of the nonrecurring activities that an

in its Synthesis Model ("SM") are not appropriate for establishing UNE rates. Second, SM's switching input was based on nationwide data, not Arizona-specific data.

²⁰ Tr. at 315 (Chandler Cross).

²¹ Ex. Qwest-1 (Brigham Dir.) at 5.

²² Ex. Qwest-1 (Brigham Dir.) at 5.

efficient carrier would incur and the probability that each activity will occur.²³ With input from the SMEs, each work time probability is then analyzed to determine if there is a reasonable potential for improvement through increased efficiency. Third, the cost analyst determines the appropriate labor rate for the personnel performing each work activity.²⁴ Once this information is gathered, the cost analyst loads this information into the ENRC, and the ENRC calculates the direct nonrecurring cost for each work activity by multiplying the time estimate by the probability of occurrence and the appropriate labor rate. Fourth, the ENRC aggregates the nonrecurring cost for each work activity into a direct nonrecurring cost for each UNE.²⁵ Finally, the ENRC applies annual cost factors and common costs to the direct costs to derive the TELRIC for the element.²⁶ The study also includes assumptions and expectations for increased mechanization, including an average flow-through rate of approximately 60 percent that reflects forward-looking OSS efficiencies Qwest expects to achieve. It bears emphasis that even with the unrealistically high flow-through rate of nearly 100 percent that the Joint Intervenor assumes, significant manual activity still would be necessary, including running jumpers, designing circuits, and testing for switch ports require significant manual activity. For example to install a line port, an engineer must first map out the circuit in the central office between the switch and a CLEC's collocation cage and enter the location of each terminating point into the proper database. Then, Qwest employees must run the jumpers between the switch and the CLEC collocation area and, in some cases, cross-connect intermediate frames with other terminations. In addition, an engineer must test the various circuits to ensure they work properly. No amount of mechanization through OSS will eliminate these activities.

²³ Ex. Qwest-1 (Brigham Dir.) at 6.

²⁴ Ex. Qwest-1 (Brigham Dir.) at 6.

²⁵ Ex. Qwest-1 (Brigham Dir.) at 6.

²⁶ Ex. Qwest-1 (Brigham Dir.) at 6.

D. Qwest's Switching Cost Model Produces Arizona-Specific Rates.

As part of the ICM, SCM calculates switching investments for each of the switching services and elements described above. SCM calculates busy hour unit investments, or the amount of switch processor and related hardware that a switch requires to handle the volume of calls that occurs at the busiest time of the day. It calculates these investments on an investment per call setup and per minute of use for various types of calls.²⁷ All of these functions ultimately provide data for determining the size of switches, which is similar to determining the size of the processor on a PC and the amount of memory and storage needed for the PC.

The primary cost drivers in SCM's calculation of investment for switching are: (1) the prices that switching vendors charge for switches; (2) the busy-hour demand per line and per trunk within a switch; (3) the number of lines a switch serves (again issues of processor and memory size); and (4) the trunk to line ratio (*i.e.*, the size of the ports which are the equivalent of the plugs for peripherals and modems on a PC) required to meet the demand at the switch.²⁸ As described above, for each of these inputs, the SCM uses information that is not only specific to Arizona but is also specific to *every switch location* in the state. In the hearing, Qwest cost witness, Robert Brigham described how, in contrast to the national averaging approach of the HAI model, SCM develops investment for every switch location in Arizona:

The purpose of SCM is to develop the investment for *every switch* so it looks at the individual characteristics of the switch. It also looks at the estimates of growth in that switch, the estimates of how many lines there are in that switch, that kind of thing. So it takes switch-specific information, and it develops a cost or investment for each individual switch.

* * * *

[T]he thing that makes our model superior is basically that it goes down and looks at each individual switch and the characteristics of that switch,

²⁷ Ex. Qwest-1 (Brigham Dir.) at 12.

²⁸ Ex. Qwest-1 (Brigham Dir.) at 12.

and it's based on *Arizona-specific information*. It's not based on a national average, if you will.²⁹

Indeed, in the Recommended Opinion and Order ("ROO") in Phase II of this docket, the ALJs emphasized the importance of use Arizona-specific data to calculate UNE costs.³⁰ Consistent with that principle, Commission should favor the Arizona-specific inputs of the SCM over the national averages of the switching module of the HAI.

In addition to the cost drivers discussed above, key inputs into SCM are switch growth rates, administrative fill factor for both analog lines and integrated digital lines and the administrative fill factor for digital trunks. Qwest uses a growth rate of 4.8984% that is based on a forecast of growth in switched analog and integrated digital lines for 1999 through 2000 prepared by Qwest's Local Markets Forecasting Unit.³¹

Qwest uses an administrative fill factor of 95 percent for analog and digital lines. The five percent spare capacity resulting from this assumption is essential to a sound engineering design; it allows for equipment malfunctions and recognizes that some lines have to be set aside for testing, special events, and administrative purposes. Administrative spare capacity also allows for circumstances where CLECs exceed their line forecasts and for high churn rates in dedicated inside plant. But, in addition, Qwest must have spare capacity to meet short-term growth from additional customers.³² Thus, the overall fill factor in SCM is 80 percent, which provides for some short-term growth without the need to order and install increases in switch processor capacity. All of these issues again affect the size of the switch's processor main memory, just as the amount of data passing through a PC affects the size needed for its processor and memory.

²⁹ Tr. at 190 (Brigham Redirect) (emphasis added).

³⁰ See, e.g., ROO at page 15, lines 15-17; page 18, line 20 through page 19, line 4; page 26, lines 5-7.

³¹ Ex. Qwest-1 (Brigham Dir.) at 13.

³² Ex. Qwest-1 (Brigham Dir.) at 14.

It is also necessary to have a separate fill factor for digital trunks to account for the modularity of trunk ports (the gateways to the switch, which resemble the plugs for peripherals and network cards on a PC). The term "modularity" refers to the minimum amount of capacity that must be added to meet the next increment of demand when current capacity is exhausted. In the case of trunks, as Qwest adds a new trunk group to meet demand, a certain amount of spare capacity will exist until demand catches up with the available capacity. The average number of trunks per trunk group is 64, and Qwest's experience demonstrates that an average of 12 trunks, or one-half of a DS1, are unused because of modularity. Accordingly, the administrative fill factor for digital trunks, based on modularity, is 81 percent.³³

The rates set by SCM are set forth in Ex. RHB-1. The key comparison rates discussed *infra* versus the HAI switching module rates are end office switching (\$0.0026) recurring analog ports (\$2.45 per month) and nonrecurring analog line port (\$145.57). Qwest urges the Commission to adopt these rates rather than the HAI switching module rates of \$0.00121, \$0.90 and \$1.69 respectively. Qwest also urges the Commission to adopt the rest of the switching rates set forth in Ex. D and compared to the HAI rates in Ex. D.

E. The ICM Properly Estimates the Recurring Analog Line Port Rate and Appropriately Includes Vertical Features Costs.

To calculate the recurring costs of the analog line port UNE, Qwest examines three cost components: the analog line port which runs from the switch to the CLEC collocation area (including line card and NTS equipment which again are the rough equivalent of plug ins on a PC), feature cost per line (the equivalent of application software running programs such as Word or Excel on a PC), and capital lease "right to use" fees assessed by switch vendors for the use of their intellectual property. Qwest proposes an analog line port recurring rate of \$2.45

³³ Ex. Qwest-1 (Brigham Dir.) at 14-15.

comprised of \$1.28 for analog line port costs, \$0.65 for features, and \$0.51 for capital lease software expenses.³⁴

Qwest estimates the analog line port cost component by calculating the forward-looking investment for the analog line port through the SCM Core and then converting the investment into a monthly cost via the application of cost factors in the ICM. In response to requests from CLECs, Qwest has included the recurring costs of features in the recurring rate for the analog line port instead of pricing features as a separate UNE.³⁵ Qwest calculates the feature cost per line by determining the anticipated efficient replacement investment for each feature, in terms of application software and the hardware necessary to run that software, through the SCM Features module. Once this investment is determined, Qwest converts the investment for each feature to a cost per month based on the application of cost factors. Specifically, each individual cost feature is multiplied by the quantity for each feature to derive a total monthly cost for each feature. This total monthly cost then is aggregated to produce a total-forward looking cost for the market basket of features. This aggregate cost is divided by the total Arizona lines in service to determine a monthly feature cost per line. Capital lease right to use fees are the fees Qwest pays to vendors to use their switch applications software. Qwest estimates the capital lease right to use fees by identifying the annual capital lease applications software expenses it incurs and dividing this amount by the total number of forecasted Qwest lines. The TELRIC is then calculated by applying costs factors to the direct expense.

Staff's witness, William Dunkel, claims that Qwest's proposed recurring rate for analog line ports should be reduced to \$1.61 per month. According to Mr. Dunkel, the correct rate should include \$1.10 for analog line port costs and \$0.51 for features as opposed to Qwest's proposed combined rate of \$2.45. Mr. Dunkel includes no cost recovery for right to use fees.

³⁴ Ex. Qwest-2 (Brigham Surreb.) at 14-15.

³⁵ Ex. Qwest-1 (Brigham Dir.) at 15-16.

Mr. Dunkel's recommended rates are inconsistent with TELRIC and should be rejected. Specifically, Mr. Dunkel does not consider all of the cost components and features that should be included in the recurring analog line port rate, as TELRIC requires. His estimate of \$1.10 for analog line port costs is low because it relies on the HAI model's substantial understatement of switching costs and recommended rate of \$0.90. In addition, Mr. Dunkel's reliance on the HAI model means, as shown below, that his estimate does not include applications software costs. These costs are significant and represent a major investment by Qwest or any other carrier that is required to meet CLEC demand for switching and features. For example, from 1998 through 2000, Qwest spent over \$78 million per year on application software, not including amounts spent for wireless and local number portability.³⁶ Based on the 17,279,681 working lines in Qwest switches, this translates into \$4.53 per line per year. Assuming a 10-year life of a switch, this translates into another \$45.30 per line that Mr. Dunkel does not consider.³⁷ Mr. Dunkel's proposed rate also does not include hardware and increases in memory necessary to run the features software.³⁸ Just as PCs often require memory and storage upgrades to run more applications programs simultaneously, switches need more hardware to run more software and provide more features. The exclusion of these costs improperly reduces the recurring analog line port rate and does not permit an efficient carrier to recover legitimate, forward-looking expenses. Accordingly, Mr. Dunkel's proposed recurring rate for analog line ports should be rejected.

Mr. Dunkel also challenges Qwest's proposed rate based on his mistaken assumption that it includes costs limited to Centrex 21 features. Specifically, Mr. Dunkel misinterprets how Qwest analyzed data relating to Centrex 21 features. In developing its analog line port rate, Qwest estimated total investment in both retail and wholesale features and then divided by the

³⁶ These data are an example of how historical costs provide a meaningful comparison for determining appropriate TELRIC rates. Again, Qwest provides these data not as the foundation for TELRIC rates, but as evidence relevant to determining TELRIC rates.

³⁷ Ex. Qwest-5 (Fleming Reb.) at 94.

³⁸ Ex. Qwest-5 (Fleming Reb.) at 95.

total anticipated number of features sold. These quantities include POTS, wholesale, and Centrex quantities for a particular feature. This approach is necessary to calculate the total incremental cost of all features in Arizona because the same hardware and software provides features for both wholesale and retail customers. This does not mean that Qwest is developing a cost solely for the retail Centrex 21 offering or any other Centrex or POTS retail offering, or that costs properly attributed to those offerings have instead been loaded into the UNE rates. Qwest offers CLECs the same feature functionality offered to retail and Centrex 21 customers as part of the analog line port UNE. Adding in the hardware and software costs for features will increase the recurring rate for the analog line port by \$1.06 above the HAI switching module recommendation of \$0.90 and \$0.35 above Mr. Dunkel's recommendation. Thus, the Commission should adopt Qwest's SCM estimate of \$2.45 for a line port or, at a minimum, for the \$2.06 yielded by the Qwest's modifications to the Joint Intervenor and Staff proposals.

F. The ICM Properly Estimates the Non-Recurring Rate for Analog Line Ports.

Mr. Dunkel also argues that Qwest's proposed nonrecurring rate for the analog line port, which connects the switch to the CLEC's collocation equipment, is excessive. With little analysis, Mr. Dunkel proposes that Qwest's nonrecurring analog line port rate should remain at its current level of \$42.58. Mr. Dunkel's analysis is inaccurate, violates TELRIC, and should be rejected.

As described above, Qwest properly estimates its nonrecurring rates by considering the activities an efficient carrier would undertake to process an order or provide a service. The activities, work times, and probabilities of occurrence are all supported by input from Qwest's subject matter experts who are involved in the order provisioning process. Mr. Dunkel apparently does not take issue with any of the specific input from these experts that lead to Qwest's proposed rate. Instead, he simply eyeballs Qwest's proposed rate, pronounces it too high, and proposes a lower rate. Mr. Dunkel's conclusion is not based on any meaningful analysis or evidence, and is thus not entitled to any weight. In all events, Mr. Dunkel's

conclusory, unsupported assertions are not sufficient to overcome the evidence, based on experienced, qualified SMEs, supporting Qwest's proposed rate.

While Mr. Dunkel and the Joint Intervenors challenge Qwest's proposed nonrecurring rate for an analog line port, no one specifically addresses or contests the actual activities and times that Qwest's experts provide for calculating the costs to provision a port. In contrast, Qwest's study includes over two hours of manual activity to design the circuit for the port and run jumpers in the central office, test the port and update the information in the switch database. AT&T's ENRC has no time for any of these activities and includes its usual 98 percent flow-through assumption, despite AT&T's agreement to use 85 percent flow-through in the ROC Qwest Performance Assurance Plan ("QPAP") docket, and the absence of any evidence that a 98 percent flow-through rate is attainable by any carrier today.

G. The HAI Model Does Not Produce Accurate Estimates For Switching.

The HAI model materially underestimates switching costs in a manner that is grossly inconsistent with TELRIC. A simple comparison between the switching costs produced by the HAI model and the switching costs estimated by Qwest using its most recent contracts with switch vendors illustrates the significance of the HAI model's understated results. . . . The HAI model's estimate to replace network switches is approximately 60% of the cost that Qwest estimates it will incur to buy the switches.³⁹ Using last year's contracts, ICM produces a per line 10 year lifecycle investment of \$157 per line, while the HAI switching module produces a per line investment of approximately \$90.

1. The HAI Model Blindly Incorporates the FCC's *Inputs Order*, Notwithstanding the FCC's Repeated Statements that the *Order* is Inappropriate for Use to Establish UNE Rates.

During the hearing, Mr. Chandler, the primary developer of the HAI model with respect to network components, admitted that he had not analyzed or scrutinized the inputs used in the HAI model. He stated, "my clients as a matter of their own internal policy will determine what

³⁹ Ex. Qwest-5 (Fleming Reb.) at 82.

the inputs need to be."⁴⁰ Mr. Chandler did not consider an evaluation of the appropriateness of the HAI model's inputs to be "his job," the parameters of which he deemed to be within the exclusive control of his clients – the CLECs.⁴¹ He acknowledged that the model relies almost exclusively on the FCC's *Inputs Order*, while stating candidly that he could not explain how the FCC developed switching investment.⁴² In fact, the HAI model's substantial reliance on the FCC's inputs is reason enough to reject use of the model's switching module.

The FCC has consistently rejected claims that determinations in the *Inputs Order* in general, and with respect to switching in particular, should be used in determining UNE rates. Specifically, the FCC has warned that the Synthesis Model and the *Inputs Order* "should not be relied upon to set rates for UNEs."⁴³ The Joint Intervenor fails to acknowledge this holding.⁴⁴ Two factors make the *Inputs Order* an improper guide for UNEs. First the order did not intend to determine costs, but instead to allocate subsidy funds. Second, for the purpose of calculating Arizona UNE costs, inputs specific to Arizona are preferable to the FCC's nationwide inputs for universal funding. Accordingly, the Commission should reject the HAI model in favor of the Arizona-specific data that because Qwest's SCM uses to calculate switching investment.

⁴⁰ Tr. at 315 (Chandler Cross).

⁴¹ Tr. at 315 (Chandler Cross) and 343 (Chandler Recross).

⁴² Tr. at 311-12 (Chandler Cross).

⁴³ Memorandum Opinion and Order, *In the Matter of Joint Application by SBC Communications Inc., Southwestern Bell Telephone Company, and Southwestern Bell Communications Services, Inc. d/b/a Southwestern Bell Long Distance for Provision of In-Region, InterLATA Services in Kansas and Oklahoma*, CC Docket No. 00-217, FCC 01-29 ¶ 84 (rel. Jan. 22, 2001).

⁴⁴ During the hearing, Mr. Chandler admitted that he was aware of the FCC's position with respect to the use of the Synthesis Model to develop UNE costs. When asked whether the switching investment developed by the FCC was for universal service, Mr. Chandler stated "Yes. The inputs – the FCC inputs process was for that purpose, and that includes getting switching numbers, sure." Tr. at 318 (Chandler Cross). Likewise, when asked whether the FCC developed the Synthesis Model for the purpose of calculating UNE costs, Mr. Chandler stated that "the FCC has not." *Id.* at 319. Despite knowing the purpose and design of the Synthesis Model and of the switching investment developed by the FCC, the supporters of the HAI model nevertheless elected to use the FCC's inputs in the HAI model.

Second, the HAI model fails to provide any data evidencing the reasonableness of these inputs and relies solely on the FCC's purported endorsement of them in the *Inputs Order*. Indeed, as evidenced by the following exchange, Mr. Chandler is not aware how the FCC's switching investment was developed and thus has no independent basis to offer an opinion:

Mr. Devaney: And I take it you've never seen the data the FCC used?

Mr. Chandler: I've never seen that data. I've never discussed any of this with the FCC staff or anybody involved in collecting that data.

Mr. Devaney: By the way, I think you said in your testimony you are the primary developer of the HAI Model?

Mr. Chandler: With the network components, yes.

Mr. Devaney: And so just to be clear, you've never analyzed the FCC's investment data that's used in the HAI Model?

Mr. Chandler: That's true.

Mr. Devaney: I take it, then, you don't know what states the data come from?

Mr. Chandler: That's correct. . . .

Mr. Devaney: And you wouldn't know, then, whether the investment in the HAI Model includes investments specific to any switches in Arizona; is that correct?

Mr. Chandler: I would have no idea.⁴⁵

As this discussion illustrates, the HAI model uses inputs that even its own designer does not understand. Rather than conduct their own analysis of the FCC's data, the Joint Intervenor blindly accept the FCC's inputs and argue, without any support, that they are proper.

Besides not understanding the FCC's inputs, the Joint Intervenor also fail to provide Qwest with any meaningful opportunity to review and scrutinize the HAI model's inputs. Indeed, the Joint Intervenor have not provided any data underlying the FCC's inputs that the HAI model uses. During the hearing, Mr. Chandler admitted that he had not produced any FCC data that would assist in verifying the appropriateness of the HAI model:

⁴⁵ Tr. at 314-15 (Chandler Cross).

Mr. Devaney: I take it that the FCC itself had sophisticated calculations they'd use to develop investment that in turn was used in the HAI Model, correct?

Mr. Chandler: One assumes.

Mr. Devaney: And those have not been provided with the HAI Model, correct?

Mr. Chandler: That's right.⁴⁶

A little later Mr. Chandler admitted that he never audited the FCC's calculations because the CLECs never authorized him to do so.⁴⁷ Without this information, there is no way to audit the calculations used to derive the switching investment and it is impossible to verify the appropriateness of the HAI model. Accordingly, the Commission should reject the HAI model.

2. The HAI Model Improperly Includes The Analog Line Port Offset.

Even though its proponents claim that the HAI model follows the *Inputs Order*, the model in fact departs from the Order where doing so decreases costs. Specifically, the model decreases costs to account for alleged efficiencies provided by using digital instead of analog line-side ports.

This "analog line port" downward adjustment should not be included in the HAI for two reasons. Even though the HAI switching module supports most FCC inputs, the FCC specifically held that the analog line circuit offset was improper because the depreciation data used to calculate the switch investment already reflected the savings associated with digital lines. In its Tenth Report and Order, the FCC stated:

In the *Inputs Further Notice* we tentatively concluded that the "Analog Line Circuit Offset for Digital Lines" input should be set at zero. We now affirm that conclusion. . . .

The record contains no basis on which to quantify savings beyond those taken into consideration in developing the switch cost. We also note that the depreciation data used to determine the switch costs reflect the use of digital lines. The switch

⁴⁶ Tr. at 342 (Chandler Recross).

⁴⁷ Tr. at 343 (Chandler Recross).

investment value will therefore reflect savings associated with digital lines. AT&T and MCI's proposed analog line offset per line is based on assumptions that are neither supported by the record nor easily verified.⁴⁸

The Joint Intervenors admit they have included the analog line downward adjustment despite the FCC's express rejection of it.⁴⁹ Second, the Joint Intervenors rely on speculative figures to calculate the analog line port offset. During the hearing, Mr. Chandler admitted that he assumed 18.3 percent of the analog ports would be converted to digital to develop the offset amount. He claimed that this rate was taken from the depreciation data compiled and used by the FCC in its *Inputs Order*. He justified his assumption by stating "[t]hat number came to me from the AT&T clients, and I believe that number was at least discussed in those [informal discussions at the FCC] meetings. I can't go beyond that because I was not there."⁵⁰ However, the FCC clearly stated that its data cannot be used to determine the digital line rate:

[I]t is not possible to determine from the depreciation data the percentages of lines that are served by digital connections. It is therefore not possible to verify AT&T and MCI's estimate of the digital line usage in the "historical" data. In the absence of more explicit support of AT&T and MCI's position, we conclude that the Analog Line Circuit Offset for Digital Lines should be set a zero.⁵¹

In this case, as in the FCC's Universal Service docket, the Joint Intervenors have not provided any data relating to the percentage of lines included in the FCC's investment calculations that were served by digital connections. Just as the FCC found in that case, there is no evidentiary support in this case for application of an analog line circuit offset.

⁴⁸ *Inputs Order* at 325 and 327.

⁴⁹ Tr. at 320 (Chandler Cross).

⁵⁰ Tr. at 341 (Chandler Recross).

⁵¹ *Inputs Order* ¶ 327.

Accordingly, for the reasons set forth above, the Commission should reject the Joint Intervenor's attempt to include an analog line port offset. Eliminating this adjustment would increase MOU costs by \$0.00024 and port costs by \$0.19 per month.⁵²

3. The HAI Model Fails To Include Growth Lines And Uses Incorrect Fill Rates.

The combination of excluding increases in switch size to accommodate growth lines and the use of unrealistic fill levels also results in understated switching estimates by the HAI model. The Joint Intervenor's argue that the HAI switching module properly excludes costs for growth lines because to do otherwise would unfairly and uneconomically burden today's customers and would result in an intergenerational cross-subsidy.⁵³ They also argue that the HAI model's use of a 94% fill factor is reasonable and appropriate. This combination of sizing a switch with no spare capacity and never expanding it, eliminates all margin of error in switch sizing and invites busy signals and call blocking, similar to a PC telling a user that there is not enough memory to run a new application program or download certain data from the internet.

The Commission should join the FCC and the D.C. Circuit and reject Joint Intervenor's position that it is inappropriate to include in base switching rates not merely the cost of new switches, but also the cost of additional lines required to meet demand. As a preliminary matter, the Joint Intervenor's rhetoric about fairness and cross-subsidies is both legally irrelevant and factually incorrect. The standard to consider are the costs that an efficient carrier would incur to construct and operate a replacement network. The Joint Intervenor's do not address that standard. In all events, there is nothing "unfair" or uneconomic" about developing costs based on purchases of both new switches and additional lines.

Thus, in the *New York section 271 Order*, the FCC explicitly rejected AT&T's argument "that TELRIC does not permit recovery of the cost of 'augmented switches,' which are existing

⁵² See Ex. B.

⁵³ Ex. AT&T-10 (Kelley Reb.) at 7.

switches with capacity upgrades.” *New York Order* ¶ 243. AT&T appealed this issue to the D.C. Circuit, which similarly rejected AT&T’s claim. *AT&T Corp. v. FCC*, 220 F.3d 607, 617-18 (D.C. Cir. 2000). The court noted that:

FCC counsel explained that growth additions to existing switches cost more than new switches only because vendors offer substantial new switch discounts in order to make telephone companies dependent on the vendors’ technology to update the switches.

Id. at 618. Based on that explanation, the court found that “the Commission reasonably concluded” that “inclusion of growth additions” “did not violate TELRIC.” *Id.* Undaunted, AT&T raised this same issue in subsequent section 271 cases, and the Commission has rebuffed it each time. *See Massachusetts Order* ¶ 33; *Kansas/Oklahoma Order* ¶ 77. Inexplicably, AT&T’s Comments do not even cite those directly relevant decisions.

Outside of Arizona, AT&T has conceded that using such a mix of new and growth lines to determine costs is appropriate. An AT&T witness in California has testified that “the discount percentage input should reflect the mix of new switch and growth lines that the [incumbent] plans and has committed to purchase.”⁵⁴

1. The HAI Model's Use Of A 94% Fill Factor Exacerbates The Improper Effect of Excluding Growth Lines.

The HAI model's assumption of a 94 percent fill level in switches adds to the improper reduction in investment that results from failing to include the costs of growth lines. This level of fill is plainly unrealistic for several reasons.

First, a 94 percent fill factor does not provide any spare capacity for growth. As even the Joint Intervenors agree, an efficient provider should always maintain at least five percent spare capacity for administrative purposes.⁵⁵ A 94 percent fill rate and a five percent administrative fill rate would only allow one percent spare capacity for growth, a wholly implausible scenario. With only one percent spare capacity, a switch's total capacity would be exhausted with only the

⁵⁴ *Id.* ¶ 45 (quoting testimony of AT&T witness, Catherine Petzinger).

⁵⁵ Tr. at 369-71 (Chandler Cross).

slightest increase in demand, which would lead to busy signals and call blocking. Moreover, the rapid exhaustion of capacity that would result from operating at that level would prevent a carrier from responding promptly to requests for service from new customers, as the carrier would have to add capacity before it could accommodate new subscribers.

Second, a 94 percent fill factor does not permit an efficient provider to install modular components. Modular switching equipment (e.g., a processor) is equipment that comes in certain capacities and must be installed in pre-established incremental units. Often these increments units are large enough to render the utilization rate of a switch less than 94 percent immediately after the modular equipment is installed. By assuming a 94 percent fill factor, the HAI model does not consider the requirements of modular equipment and ignores the practicalities associated modular additions. If a 94 percent fill rate is required, an efficient provider would likely fall below the proposed 94 percent fill factor with relatively minor modular additions.

Third, growth equipment (e.g., line cards) cannot be installed in very small increments without incurring very high costs. It would make no economic sense to keep the switch at 94% fill, which would require Qwest to essentially add one line at a time when demand occurs. This would cause extremely high engineering and installation costs, and a held order would be required for every line. It is much more cost effective in the long run to add more capacity at a given time to serve growth than to add equipment in small increments. A 94% fill rate is simply not realistic for an efficient carrier.

During the hearing, the Joint Intervenors admitted that the HAI model does not consider the spare capacity required for growth and modular equipment.⁵⁶ This omission causes the model's inflated fill factor and contributes to the substantial understatement of switching costs.

Finally, there is a fundamental inconsistency between the model's use of a 94 percent fill rate and its exclusion of the costs of growth lines. The Joint Intervenors' claim that the HAI model should ignore the additional costs of lines installed for growth because they are

⁵⁶ Tr. at 372 (Kelley Cross).

hypothetical costs not deployed today. If their position on fill factors were adopted, an efficient provider would face a truly untenable situation. It would have to purchase switches and maintain a 94 percent fill factor, yet not have the ability to add additional lines. This means that the efficient provider would have to purchase new switches every time it was required to increase capacity. That approach to designing a switching network would, of course, be extremely inefficient; it would dramatically increase capital expenditures and sharply reduce the depreciation lives of switches.

The Joint Intervenors cannot have it both ways. Qwest should either: (1) recover the cost of adding additional lines if it must purchase switches sized only for the first day of operation and maintain a high fill factor; or (2) recover the cost of purchasing a switch with excess capacity, if it is forced to forego recovery of additional line costs. In the long run, the most efficient, available way to serve customers involves serving some demand with lines purchased subsequent to the purchase of a new switch. It is not efficient to purchase new switches more often, or to maintain artificially high levels of spare capacity, to avoid purchasing growth lines. A switch also needs some immediate spare capacity to serve short term demand increases without waiting for delivery of processor upgrades. The HAI model is flawed because it does not consider these realities.

Including the proper fill factors would raise MOU rates from the HAI model by \$0.0021 and the port rates by \$0.16. Adding the growth lines would raise MOU rates by \$0.00015 and port rates by \$0.11.

4. The HAI Switching Module Fails To Include Switch Upgrade Costs.

One of the major flaws of the HAI model causes it to massively understate switching costs is its failure to account for switching upgrades, which is the equivalent of adding new operating systems, application software and hardware so that a PC can provide new features such as email, internet access, video conferencing, etc. On behalf of the Joint Intervenors, both Mr.

Chandler and Mr. Kelley agree that switch upgrades are a legitimate cost of doing business.⁵⁷ During the hearing, Mr. Chandler admitted that switch vendors routinely issue switch upgrades approximately every two years and that to stay competitive and current with legal requirements, telecommunications carriers routinely purchase switch upgrades.⁵⁸ Mr. Kelley also recognized that switch upgrades are common in the telecommunications industry.⁵⁹ However, the Joint Intervenor, through Mr. Kelley, argue that "the proper application of TELRIC principles excludes from forward looking switching costs both ongoing upgrade costs and the costs of adding new lines."⁶⁰ As support, Mr. Kelley again relies, improperly, on the FCC's *Inputs Order*. As noted above, the FCC has made it clear that the Synthesis Model does not produce TELRIC data for use in pricing local interconnection service and UNEs.

In addition, the HAI switching module's reliance on the FCC's *Inputs Order* algorithm is incorrect because it does not include the ongoing upgrade investments necessary to keep a switch technologically current once it is installed. According to Appendix C of the *Inputs Order*, the FCC's algorithm results from a regression analysis performed on data from depreciation rate reports filed by LECs for switches installed from 1983 to 1995 and upon similar data from LEC reports to the RUS. However, a large portion (70 percent) of the nearly 3,600 observations were excluded from the study data so that only 1,085 observations were actually employed. Most of the excluded observations were from switches installed more than three years prior to the reporting of their book-value costs. The FCC only tried to reflect the cost associated with the purchase of a new switch; the investment associated with upgrades was intentionally omitted. Although this sort of "rough justice" may be acceptable for the purpose of allocating universal

⁵⁷ Ex. AT&T-10 (Kelley Reb.) at 3.

⁵⁸ Tr. at 315-16 (Chandler Cross).

⁵⁹ Tr. at 353 (Kelley Cross).

⁶⁰ Ex. AT&T-10 (Kelley Reb.) at 3.

service support, it clearly is not appropriate for developing UNE rates, as the FCC and the courts have confirmed.

The HAI model also does not include the cost of vertical features implemented after 1995 or any of Qwest's applications software expenses after 1992. By excluding these costs from the data that the FCC used to estimate its switch expenses, the FCC set an improper cost for switches that does not include the cost of features. As mentioned above, the FCC relied on data from 1983 through 1995 to develop its switching investment. This data, therefore, does not include vertical features costs after 1995. When questioned about the FCC's exclusion of data after 1995, Mr. Kelley admitted that because the FCC excluded these costs for the purposes of allocating universal service support, the HAI model likewise does not include vertical features costs after 1995.⁶¹ Similarly, the FCC's algorithm does not account for the applications software costs that any provider incurs. The FCC admittedly created its switch costs using historical data, but it failed to include the cost for features and other application software. Thus, relying on FCC upgrade costs will not provide the proper estimate of life cycle expenses for software and features. The Joint Intervenor also err in concluding that the legitimate costs of doing business should not be recovered. The cost of upgrading switches to the latest switch technology are a legitimate and necessary business expense that efficient carriers incur. Switch upgrades generally stem from either increased demand for greater switch functionality or, more commonly, legislative and regulatory mandates that are part of the environment in which the providing carrier operates. Specifically, the increase in demand or the legislative mandates force Qwest to upgrade its operating system software. This software upgrade, in turn, often requires corresponding operating hardware upgrades such as additions to existing processing capacity, memory, and storage. After multiple upgrades, the capacity of the processor is often exceeded requiring additional hardware upgrades. These are simple lifecycle costs of switches which should fall under a definition of replacement costs.

⁶¹ Tr. at 351 (Kelley Cross).

Some of the past regulatory mandates that have forced Qwest to upgrade its operating system software, and thus its switches, include the Communications Assistance for Law Enforcement Act requirements that could only be met by upgrading to the 5E14 Generic operating software in its 5ESS switches, (2) number pooling requirements – assigning blocks of telephone numbers to carriers in increments of 1,000 rather than 10,000 in order to conserve telephone numbers, (3) international direct digit dialing expansion to 15 digits, (4) interLATA equal access implementation, and (5) flexible automatic number identification (ANI) implementation to facilitate a 2 digit ANI code identifying payphone owners for carrier compensation purposes.

Because an efficient carrier building and operating a replacement network will incur switch upgrade costs, the HAI model's failure to recognize any upgrade expenses violates TELRIC. If the costs associated with switch upgrades are not included in TELRIC studies for switching, Qwest will not recover these legitimately incurred costs, even though it will incur upgrade costs on a forward-looking basis. Indeed, the Joint Intervenors admit that excluding switch upgrade costs from the switching rates will allow CLECs to use upgrades for free until rates are adjusted by the Commission.⁶²

The Joint Intervenors' response to this point is that rates can be adjusted and modified over time to reflect upgrade costs. However, the Joint Intervenors' position is untenable. It is wholly unrealistic to require Qwest to petition for a rate change -- and for the Commission to have to consider and resolve repeated petitions -- every time an upgrade is implemented. It is more efficient and economical to include upgrade costs in the switching rates and adjust those rates in the normal rate review process, just as it is more efficient and economical to project demand for any input over a reasonable interim.

Further, the Joint Intervenors incorrectly assume that Qwest's switching upgrade costs are "hypothetical costs" that are not deployed today. As shown by prior events, Qwest has been

⁶² Tr. at 354-55 (Kelley Cross).

forced to invest a substantial amount of money in switch upgrades and any efficient provider would continue to incur these upgrade costs in the future. In the four years ending December 2000, Qwest spent over \$235 million upgrading its digital switches, which translates to \$3.71 per line per year.

Further, the fact that some upgrades may not be implemented on day 1 provides no basis, at least under a proper application of TELRIC, to ignore their costs. Indeed, the Joint Intervenors admit that some ongoing costs should be considered, and they do not advocate the "snapshot" approach in all circumstances. For example, they admit that investment in switches should depreciate over 10 years. Thus, they argue that depreciation expenses should be considered over time, but that upgrade costs should not. However, if one is to perform a "snapshot" view consistent with Mr. Kelley's advocacy, one would have to modify the depreciation methodology used in TELRIC studies. TELRIC studies identify capital costs, including depreciation, cost of money and income tax. If Qwest never upgraded its switches, switches would need to be replaced sooner than 10 years to serve customers and provide adequate service given rising demand for service and features. Thus, the depreciation life should be adjusted to reflect the realities that Qwest would face in replacing switches. A 10 year life requires including all the lifecycle costs, such as upgrades, for ten years.

For the reasons stated above, upgrade costs should be included in the estimates of switching costs. Including the upgrade costs in the HAI model will increase the MOU charges by \$0.00021 and the port charges by \$0.16 per month.

5. The HAI Model Fails To Include Billing Costs.

Another reason the HAI model underestimates switching costs is because it completely ignores the cost of billing for switch usage. Collecting the calling volumes, compiling the bills and documenting the charges all cause unavoidable costs. These costs are ignored by the HAI model. Regulators have historically recognized the legitimacy of including costs of billing usage sensitive rate elements in the cost of providing those elements. During the hearing, the Joint Intervenors acknowledged that Qwest incurs expenses associated with billing and recognized that

these were legitimate expenses.⁶³ However, the Joint Intervenor could not state with any certainty that the HAI model includes these costs.⁶⁴ Accordingly, the cost estimates of the HAI model should be rejected, or at least adjusted to account for these billing costs.

6. The HAI Model Improperly Allocates Switching Investment To The Switch Port.

In calculating switching investment, the HAI model assumes that 30% of the total switching investment is assigned to the non-usage portion of the switch or the switch port as opposed to the MOU switching charges. However, in other rate proceedings, such as in Colorado and Nebraska, the HAI model assumes that 60% of the total switching investment is assigned to the switch port. The inconsistencies in the HAI model's switch port allocation is problematic because it has significant and direct impacts on minute of use and port costs for switching. While the overall effect is a wash because the same total amount of costs are divided between these two elements, the rates for these elements will vary depending upon the allocation. There is no principled or evidentiary justification for changing the allocation from one state to another.

During the hearing, Mr. Chandler was asked why the Joint Intervenor changed the switch port allocation assumption in the HAI model from state to state. He stated, "I wasn't involved in the – somebody called and said, look, we're looking through this split, and we think a 60/40 is what we want to use."⁶⁵ No other witness supporting the HAI model was able to provide a better explanation. Thus, the Joint Intervenor's use of the 30% switch investment allocation in the HAI model for Arizona appears to be an arbitrary number based not on any real world data, but solely based on the Joint Intervenor's preferred result.

⁶³ Tr. at 326 (Chandler Cross).

⁶⁴ Tr. at 327 (Chandler Cross).

⁶⁵ Tr. at 326 (Chandler Cross).

7. The HAI Model Miscalculates End Office Switching Because It Uses Dial Equipment Minutes Rather Than Billable Minutes.

To determine a switching rate, it is not enough to merely calculate costs. It is also necessary to determine the units of demand over which those costs will be spread. In the case of switching, the units are billable minutes of end office switching. But the HAI model does not use billable minutes. Rather, the model uses dial equipment minutes, thereby reducing rates by \$.00008 per minute. Using the dial equipment minutes as opposed to billable minutes is improper, as explained below.

Originating dial equipment minutes are measured from the time a party picks up the phone and includes call set up time. Switching costs are incurred over the same increment. But industry practice, to which the CLECs have not objected, is to apportion these costs to customers based on minutes measured from when the called party answers for intraLATA calls or until the trunk to the IXC is seized in the case of interLATA calls. Thus, billing minutes are measured from the time the called party answers. The difference between dial equipment minutes and billable minutes in this case is 4.4 percent, which implies that the cost per minute should be 4.4 percent higher if the HAI model used billable minutes as the correct denominator.⁶⁶ During the hearing, the Joint Intervenors admitted that it would be appropriate to use billable minutes rather than dial equipment minutes in calculating end office switching in this case.⁶⁷ Accordingly, the HAI model should be adjusted to reflect billable minutes as opposed to dial equipment minutes. Otherwise, CLECs will not bear switching costs attributable to the process of setting up calls originated by CLEC customers.

III. The Commission Should Adopt Qwest's Proposed Rates Relating to Collocation.

Remote terminal ("RT") collocation provides space to CLECs in available remote cabinets on a Standard Mounting Unit ("SMU") level. The space includes access to AC/DC

⁶⁶ Ex. Qwest-5 (Fleming Reb.) at 94-95.

⁶⁷ Tr. at 329 (Chandler Cross).

power, heat dissipation, and Feeder Distribution Interface ("FDI") terminations.⁶⁸ RT collocation allows CLECs to access Digital Subscriber Line ("DSL") customers that normally are beyond the technical limits of the CLECs' collocation at the central office. DSL service can only be provided within 18 Kilo feet of a DSLAM.⁶⁹ RT collocation allows CLECS to place their equipment in Qwest owned or leased Outside Plant Structures, such as a DA Hotel, in order to convert the digital signal in the fiber feeder to DSL over the copper distribution to the customer at a point less than 18,000 feet from the customer.⁷⁰ In most instances, RT collocation is the only method available to Qwest and CLECs to access customers beyond the distance limitations of the central office. Through RT collocation, both Qwest and CLECs are able to access the same universe of customers.⁷¹

Qwest has a process to ensure that CLECs' remote collocation needs are met. Qwest's DA Hotel planning team provides participating CLECs with Qwest's proposed deployment of DA Hotels, by wire center, at a Distribution Area level.⁷² Following site disclosure, CLECs have thirty days to notify Qwest of their desire to participate in the joint planning of a particular site.⁷³ The CLECs participation affords Qwest the ability to properly size the DA Hotel to house equipment, provide for power consumption, and consider heat dissipation requirements.⁷⁴ If one or more CLECs do not participate in the joint planning of a DA Hotel, Qwest will add 15 percent to the size of the DA Hotel, which is consistent with precedent established in the Ameritech/SBC

⁶⁸ Ex. Qwest-11 (Malone Dir.) at 12.

⁶⁹ Ex. WorldCom-5 (Morrison Reb.) at 6.

⁷⁰ Ex. Qwest-9 (Hubbard Surreb.) at 9.

⁷¹ Tr. at 393 (Morrison Cross).

⁷² Ex. Qwest-9 (Hubbard Surreb.) at 10.

⁷³ Ex. Qwest-9 (Hubbard Surreb.) at 10.

⁷⁴ Ex. Qwest-9 (Hubbard Surreb.) at 10.

merger and was requested by the CLECs in the SGAT case.⁷⁵ Qwest provides this spare capacity so that CLECs can more easily engage in RT collocation and so that they will have an easy means to access RT collocation. This spare space will be offered to CLECs on a first come, first serve basis.

Traditionally, the fill rates of RT collocation facilities are extremely low. Because each remote terminal serves only a fixed number of homes, relatively few CLECs place DA in any particular DA Hotel.⁷⁶ Indeed, since Qwest began formally offering RT collocation in February 2001, only one CLEC has ordered RT collocation in Qwest's region.⁷⁷ That order only requested two DA Hotel sites.⁷⁸ Given this reality, Qwest uses a 33 percent fill rate in its RT collocation studies. Mr. Dunkel argues that this rate is too low and that it should be raised to 61.25 percent.⁷⁹

Mr. Dunkel's proposed rate is inflated and will penalize Qwest for trying to comply with its obligation to ensure that CLECs have easy access to RT collocation because he bases his rate on equipment that is not comparable to RT collocation equipment. Buried distribution and feeder cable fills (relied on by Dunkel) have little in common with a remote terminal collocation cabinet and there is no reason to believe that these distinct types of facilities should have the same fill rates.⁸⁰ To realize the type of fills Mr. Dunkel proposes, CLECs need to use part of Qwest's area on a space available basis, not require a 15 percent CLEC set aside (which seems currently unacceptable to at least some CLECs), and take the risk that no space might be open.

⁷⁵ Ex. Qwest-9 (Hubbard Surreb.) at 10-11.

⁷⁶ Tr. at 398 (Morrison Cross).

⁷⁷ Ex. Qwest-2 (Brigham Surreb.) at 11-12.

⁷⁸ Ex. Qwest-2 (Brigham Surreb.) at 11-12.

⁷⁹ Ex. S-8 (Dunkel Dir.) at 7-8; Tr. at 442 (Dunkel Direct).

⁸⁰ Ex. Qwest-2 (Brigham Surreb.) at 19.

Thus the Commission should adopt Qwest's RT rates. Alternatively the commission might eliminate the set aside space and use Staff's 61 percent fill factor.

The Joint intervenors also raise several concerns regarding Qwest's proposed RT collocation offering. First, they argue that the Commission should order Qwest to unbundle network transport elements so that CLECs may virtually collocate ADLU cards in Qwest's RT DSLAM equipment.⁸¹ That recommendation, however, finds no basis in the law because the FCC has not mandated that Qwest, or any other ILEC, unbundle network elements to allow ADLU card collocation. The Joint Intervenors also could not prove that the FDI which allegedly provides for card at a time collocation is readily available from a variety of manufacturers.⁸²

Also, the Commission Staff and Administrative Law Judge have recommended that Qwest not be required to provide ADLU card collocation until the FCC orders because the feasibility of ADLU card collocation is undetermined at this time.⁸³ In Docket No. T-00000A-97-0238, Final Report on Qwest's Compliance with Checklist Item No. 1 – Interconnection and Collocation, dated October 12, 2001, Staff recommended that Qwest not be required to go beyond current FCC rules. The recommended decision concluded that the record was insufficient to establish whether ADLU cards are a feasible option for collocation and, therefore, Qwest should file a revised SGAT provision after the FCC has made a final determination.

According to WorldCom, a CLEC faces the unfair possibility that after paying the nonrecurring charge the customer is lost and the CLEC is stuck with RT collocation space that it no longer needs and cannot recoup the cost thereof.⁸⁴ This is an ordinary risk that any business faces when adding capacity. Qwest would also face the same unfair possibility under WorldCom's proposal to shift the cost to a recurring charge.

⁸¹ Ex. WorldCom-5 (Morrison Reb.) at 5.

⁸² Tr. at 394-95 (Morrison Cross).

⁸³ Tr. at 272-73 (Hubbard Direct).

⁸⁴ Ex. WorldCom-5 (Morrison Reb.) at 13.

IV. Custom Routing: Qwest's Cost Study Relating to Custom Routing Produces Proper TELRIC Rates.

Custom Routing permits a CLEC to designate a particular outgoing trunk that will carry certain classes of traffic originating from the CLEC's end-users. Custom Routing enables the CLEC to direct particular classes of calls to specifically dedicated outgoing trunks that will permit the CLEC to provide its own operator services ("OS") or directory assistance ("DA") or select among other providers of OS and DA.⁸⁵ Each dedicated or separate trunk provides the signaling necessary to route calls from the customer to one specific, non-standard service or location, such as the OS or DA provider, and tracks the billing information for each call where applicable. Customized Routing is a software function of a switch that may be ordered as an application with Resale or Unbundled Local Switching.⁸⁶

Although Custom Routing applications are unique to each CLEC, Qwest proposes a nonrecurring charges based on the following Custom Routing elements: (1) development of custom line class code, (2) line class code installation per switch, and (3) all other customer routing.⁸⁷

A. Custom Routing Technology

WorldCom would like to route both DA and OS calls across shared access Feature Group D trunks instead of through separate dedicated trunks to an OS or DA provider.⁸⁸ The technical capability from this type of shared access trunk routing is simply unavailable. The DA and OS signaling are not the same as MOS and Feature Group D signaling. Thus, the calls that were destined for a DA or OS provider from an end office have different switch signaling characteristics than with standard voice calls. To keep those classes of service separate requires

⁸⁵ Ex. Qwest-11 (Malone Dir.) at 13.

⁸⁶ Ex. Qwest-11 (Malone Dir.) at 13.

⁸⁷ Ex. Qwest-11 (Malone Dir.) at 13-14.

⁸⁸ Tr. at 417 (Caputo Direct)

separate trunking. Therefore, Feature Group D traffic and DA/OS traffic cannot be aggregated on the same trunks. Further, because of the unique signaling the dedicated trunk would only be able to carry DA or OS services, not DA and OS or any combination of those services with Feature Group D or MOS.⁸⁹

WorldCom claims that this signaling difference is irrelevant since it plans to use a switch translation to retransmit customer calls across the shared access Feature Group D trunks as though the OS and DA calls were regular long-distance calls.⁹⁰ WorldCom admits, however, that no provider has commercially deployed this technology to date.⁹¹ Not only is the technology not currently available, it may never be possible. Customized Routing is done on a per switch basis, each switch requiring a specific Line Class Code (a code assigned to an OS or DA provider) where multiple USOCs are used. Essentially, each trunk group needs to be developed or built to incorporate the specific Line Class Code and features chosen by the CLEC. Thus only Qwest's proposed technical solution will work and to follow TELRIC, it should be used as the basis for the costs of custom routing.

B. Custom Routing Costs

Since Customized Routing applications are unique to each CLEC requiring individualized assessment, engineering and implementation, certain nonrecurring charges should be assessed. The nonrecurring charge categories applicable are: (1) Development of Custom Line Class Code (Directory Assistance or Operator Services Routing only); (2) Line Class Code Installation per Switch (Directory Assistance or Operator Services Routing only); and (3) all

⁸⁹ Tr. at 210-11 and 221-23 (Craig Cross).

⁹⁰ Tr. at 420-21 (Caputo Cross).

⁹¹ Tr. at 422 (Caputo Cross). Mr. Caputo testified that although WorldCom's switch vendor has provided documentation showing that the directory assistance and operator service traffic can be sent over Feature Group D trunks using switch translation, "no one is providing it to us today." Tr. at 422 (Caputo Cross).

other Custom Routing. A recurring ICB charge is assessed to maintain the LCC code developed and activated in one or more switches.

Costs relating to Custom Routing are attributed as one of three categories: (1) Direct Costs associated with an individual UNE or service; (2) Directly Attributable Costs (or Shared Costs) spread across all UNEs and interconnection services (such as collocation); and (3) Common Costs connected with the operations of Qwest as a whole (e.g. legal, external relations, research and development, etc.). In its *First Report and Order*, the FCC clearly contemplated inclusion of these categories of costs under a TELRIC methodology stating:

We conclude that, under a TELRIC methodology, incumbent LEC's prices for interconnection and unbundled network elements shall recover the forward-looking costs directly attributable to the specific element, as well as a reasonable allocation of forward-looking common costs.... Directly attributable forward-looking costs include the incremental costs of facilities and operations that are dedicated to the element. Such costs typically include the investment costs and expenses related to primary plant used to provide that element. Directly attributable forward-looking costs also include the incremental costs of shared facilities and operations. Those costs shall be attributed to specific elements to the greatest extent possible.... More broadly, certain shared costs that have conventionally been treated as common costs (or overheads) shall be attributed directly to the individual elements to the greatest extent possible....⁹²

WorldCom objects to Qwest's cost assessment on two primary grounds; (1) inclusion of common costs, and (2) inclusion of directly attributable costs, specifically the inclusion of costs for marketing and sales for Custom Routing. Common costs, by definition, are those costs that cannot be attributed to a particular product. As mentioned above, the FCC specifically mandates that TELRIC studies should include "a reasonable allocation of forward-looking common costs."⁹³ These common costs would include such things as legal expenses, external relations, research and development. Only shared costs directly related to custom routing such as wholesale product management are attributed to it. Worldcom has made no showing that any of

⁹² *In the Matter of Implementation of the Local Competition Provisions of the Telecommunications Act of 1996*, CC Docket 96-98, First Report and Order, released August 8, 1996, at ¶682 (emphasis added).

⁹³ *Id.*

the costs directly assigned to custom routing relate to retail activities. As explained in detail in phase II of this proceeding, wholesale activities such as custom routing require management and contact from Qwest or any efficient carrier. Particularly with an individually designed service like custom routing, the product managers must interact with Worldcom extensively to create the specific type of service needed to meet Worldcom's needs. Thus the Commission should accept Qwest's proposed custom routing prices, including the shared and common costs.

V. Unbundled Packet Switching.

A. Qwest's Unbundled Packet Switching Offering.

Unbundled Packet Switching ("UPS") refers to the functionality of delivering packet data units via a virtual channel between a CLEC demarcation point and the Remote Terminal Digital Subscriber Line Access Multiplexer ("DSLAM"). UPS includes transport facilities between the DSLAM and the Qwest central office, DSLAM functionality, and ATM electronics necessary to generate a virtual channel so that a CLEC can provide DSL to a user who can only be reached via a Qwest installed DSLAM at an RT.⁹⁴ Qwest does not and is not required to provide generic UPS for use throughout its network

Pursuant to the FCC's UNE Remand Order, Qwest is obligated to provide CLECs access to UPS in certain circumstances. Specifically, Qwest must offer UPS where it has deployed digital loop carrier ("DLC") systems, no copper facilities are available, and it has placed a DSLAM in a remote terminal but no space for CLEC exists. If Qwest permits CLECs to collocate their DSLAM in Qwest's remote terminal on the same terms and conditions that apply to Qwest's DSLAM, then Qwest is not required to offer CLECs access to UPS.⁹⁵

⁹⁴ Ex. Qwest-11 (Malone Dir.) at 8.

⁹⁵ Ex. Qwest-11 (Malone Dir.) at 11.

B. The Joint Intervenor's Criticisms Of Qwest's UPS Offering Are Unfounded.

1. Qwest Adequately Describes Its UPS Rate Elements.

The Joint Intervenor's argue that Qwest's technical descriptions of its UPS rate elements are inaccurate, ambiguous and, if taken at face value, describe a service that is inappropriate for applications typically used by DSL subscribers. In the prefiled testimony of Ms. Malone, however, Qwest clearly outlines its UPS offering. Qwest indicates that its UPS offering is comprised of: (1) transport facilities between a DSLAM and a Qwest central office; (2) DSLAM functionality that provides the capability and programming necessary for data feeds and routing virtual channels; and (3) the ATM electronics that are needed to generate virtual channels. The AT&T/Worldcom criticism of the Qwest UPS offering presumes that it was intended for general use throughout the network. As explained above Qwest only has to provide UPS in the limited circumstance where there is no space for a CLEC to collocate in an RT and the CLEC needs the UPS carry a DSL signal from the RT to its collocation space. Also, the Joint Intervenor's assertion that CLECs are unable to offer advanced services such as voice over DSL to their customers under Qwest's UPS offering is unfounded. While Qwest has not proposed rate elements for advanced services, CLECs are nevertheless free to offer advanced services on their own. The ability to provide advanced services like packetized voice service is a function of the customer premises equipment not the DSLAM or the ATM network. Thus, the CLECs, not Qwest determine whether advanced services can be offered. Qwest only provides the permanent virtual channel, or pipe, from an end user to a CLEC's packet switch. This channel allows the CELCs to provide whatever digital data it desires, whether it is in the form of streaming video, voice over DSL or Voice over IP. Qwest's UPS offering does not limit the products that a CLEC can offer.

2. Qwest's UPS Cost Study Is Forward Looking.

The Joint Intervenor's also argue that Qwest's proposed UPS rates are not forward-looking because they rely on a copper-based DLC system. Qwest's UPS cost study assumes a Lucent

overlay system that works with a copper-based DLC system because Qwest is costing out channels that it created by overlaying pack switching on its existing network to reach the retrofitted remote terminals.. Qwest's assumption is forward-looking because copper-based DLC will continue to be used within the industry for the foreseeable future. Qwest and other ILECs have developed DSL technology for the copper distribution loop that remains appropriate for an efficient carrier using forward-looking technologies. Contrary to the Joint Intervenor's contentions, it is unrealistic to assume that efficient carriers will cease using copper-based DLC because the technology is both prevalent and forward-looking. AT&T and Worldcom propose that Qwest use an integrated fiber system with new FDI cabinets that would completely replace the existing network as the basis for costing UPS at significantly lower levels than Qwest proposes. The addition of RTs by definition is a change to the existing network and thus UPS to the RT should be based on the cost adding to the network, not replacing the entire network. If Qwest must provide these circuits as if they were included in an all fiber network built from scratch, Qwest will simply not install RTs and no customer will receive the benefits of DSL if they live more than 18,000 feet from the CO.

Thus the Commission should use Qwest's technical definition of UPS, base the cost study on the design Qwest plans to use to connect future RTs to the central office and adopt Qwest's proposed rates.

CONCLUSION

For the reasons stated, the Commission should adopt Qwest's proposed rates for switching, remote collocation, custom routing, and unbundled packet switching.

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Respectfully submitted,

Qwest Corporation

By: 

Timothy Berg
Theresa Dwyer
FENNEMORE CRAIG
3003 North Central, Suite 2600
Phoenix, Arizona 85012

John Devaney
Norton Cutler
PERKINS COIE LLP
607 Fourteenth Street, N.W.
Suite 800
Washington, D.C. 20005-2011

Attorneys for Qwest Corporation

ORIGINAL and 10 copies of the
foregoing hand-delivered for filing
this 19th day of December 2001 to:

Docket Control
ARIZONA CORPORATION COMMISSION
1200 West Washington
Phoenix, AZ 85007

COPY of the foregoing hand-delivered
This day to:

Maureen Scott
Legal Division
ARIZONA CORPORATION COMMISSION
1200 West Washington
Phoenix, AZ 85007

Ernest G. Johnson, Director
Utilities Division
ARIZONA CORPORATION COMMISSION
1200 West Washington
Phoenix, AZ 85007

Lyn Farmer, Chief Arbitrator
Hearing Division
ARIZONA CORPORATION COMMISSION
1200 West Washington
Phoenix, AZ 85007

Dwight Nodes, Arbitrator
Hearing Division
ARIZONA CORPORATION COMMISSION
1200 West Washington
Phoenix, AZ 85007

COPY of the foregoing mailed this day to:
Steven J. Duffy
RIDGE & ISAACSON, P.C.
3101 North Central Avenue, Ste. 1090
Phoenix, Arizona 85012-2638

Richard S. Wolters
M. Singer-Nelson
AT&T
1875 Lawrence Street, Room 1575
Denver, CO 80202-1847

Allen Wong
AT&T
1875 Lawrence Street, Room 1575
Denver, CO 80202-1847

Michael W. Patten
ROSHKA HEYMAN & DEWULF
400 North Fifth St., Ste. 1000
Phoenix, AZ 85004-3906

Michael Grant
Todd C. Wiley
GALLAGHER & KENNEDY
2575 E. Camelback Rd.
Phoenix, AZ 85016-9225

Thomas H. Campbell
LEWIS & ROCA
40 N. Central Avenue
Phoenix, AZ 85007

Brian S. Thomas
TIME WARNER TELECOM
520 SW Sixth Ave., Suite 300
Portland, OR 97204-1522

Thomas F. Dixon
WORLD COM
707 17th Street
Denver, CO 80202

Eric S. Heath
SPRINT COMMUNICATIONS CO.
100 Spear Street, Suite 930
San Francisco, CA 94105

Scott S. Wakefield
RUCO
2828 N. Central Avenue, Suite 1200
Phoenix, AZ 85004

Ray Heyman
ROSHKA HEYMAN & DeWULF
400 North 5th Street, Suite 1000
Phoenix, AZ 85004

Rex M. Knowles
XO Communications, Inc.
111 E. Broadway, Suite 1000
Salt Lake City, UT 84111

Megan Doberneck
COVAD COMMUNICATIONS COMPANY
7901 Lowry Boulevard
Denver, Colorado 80230

Lisa Crowley
COVAD COMMUNICATIONS COMPANY
4250 Burton Drive
Santa Clara, CA 95054

Robert S. Tanner
DAVIS WRIGHT TREMAINE LLP
17203 N. 42nd Street
Phoenix, AZ 85032

Greg Kopta
DAVIS WRIGHT TREMAINE LLP
2600 Century Square
1501 Fourth Avenue
Seattle, WA 98101-1688

Mary S. Steele
DAVIS WRIGHT TREMAINE, LLP
2600 Century Square
1501 Fourth Avenue
Seattle, WA 98101-1688

Dennis Ahlers
Senior Attorney
ESCHELON TELECOM, INC.
730 Second Avenue South, Suite 1200
Minneapolis, MN 55402

Steve Sager, Esq.
MCLEODUSA TELECOMMUNICATIONS SERVICE, INC.
215 South State Street, 10th Floor
Salt Lake City, Utah 84111

Marti Allbright, Esq., Esq.
MPOWER COMMUNICATIONS CORPORATION
5711 South Benton Circle
Littleton, CO 80123

Penny Bewick
NEW EDGE NETWORKS
PO Box 5159
3000 Columbia House Blvd.
Vancouver, Washington 98668

Michael B. Hazzard
KELLEY DRYE AND WARREN
1200 19th Street, NW
Washington, DC 20036

Janet Livengood
Z-TEL COMMUNICATIONS, INC.
601 South Harbour Island
Suite 220
Tampa, Florida 33602

Andrea Harris
ALLEGIANCE TELECOM
2101 Webster
Suite 1580
Oakland, CA 94612

Traci Grundon
DAVIS, WRIGHT TREMAINE, LLP
1300 S. W. Fifth Avenue
Portland, OR 97201

Joan Burke
OSBORN MALEDON
2929 N. Central Avenue
Phoenix, AZ 85012



A handwritten signature, appearing to read "C. Vega", is written over a horizontal line.

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EXHIBIT A

EXHIBIT B

Comparison of Usage Rates-271 States

State	Average End Office Local Usage		Shared Transport Rate		Average Port Rate		Composite per Line
	Rate	Rate	Rate	Rate	Rate	Rate	Calculation
AZ Effective	\$	0.002800	\$	0.001573	\$	1.61	\$ 10.52
Qwest							
Proposed	\$	0.002599	\$	0.001519	\$	2.45	\$ 10.80
AT&T							
Proposed	\$	0.001210	\$	0.000074	\$	0.90	\$ 3.98
<u>Approved</u>							
TX	\$	0.001438	\$	0.000399	\$	2.22	\$ 6.28
OK	\$	0.002666	\$	0.000731	\$	2.28	\$ 9.79
KS	\$	0.001490	\$	0.000412	\$	1.61	\$ 5.81
AR ¹	\$	0.001843	\$	0.000435	\$	1.61	\$ 6.72
MO ¹	\$	0.002192	\$	0.000595	\$	2.11	\$ 8.28
MA	\$	0.003837	\$	0.001674	\$	2.00	\$ 13.60
NY	\$	0.004403	\$	0.002681	\$	2.50	\$ 16.78
PA ²	\$	0.001709	\$	0.000527	\$	2.67	\$ 7.56
<u>Filed</u>							
GA ³	\$	0.001790	\$	0.000876	\$	1.85	\$ 7.38
LA ³	\$	0.002300	\$	0.000678	\$	2.20	\$ 8.74

¹ Straight average of all zones

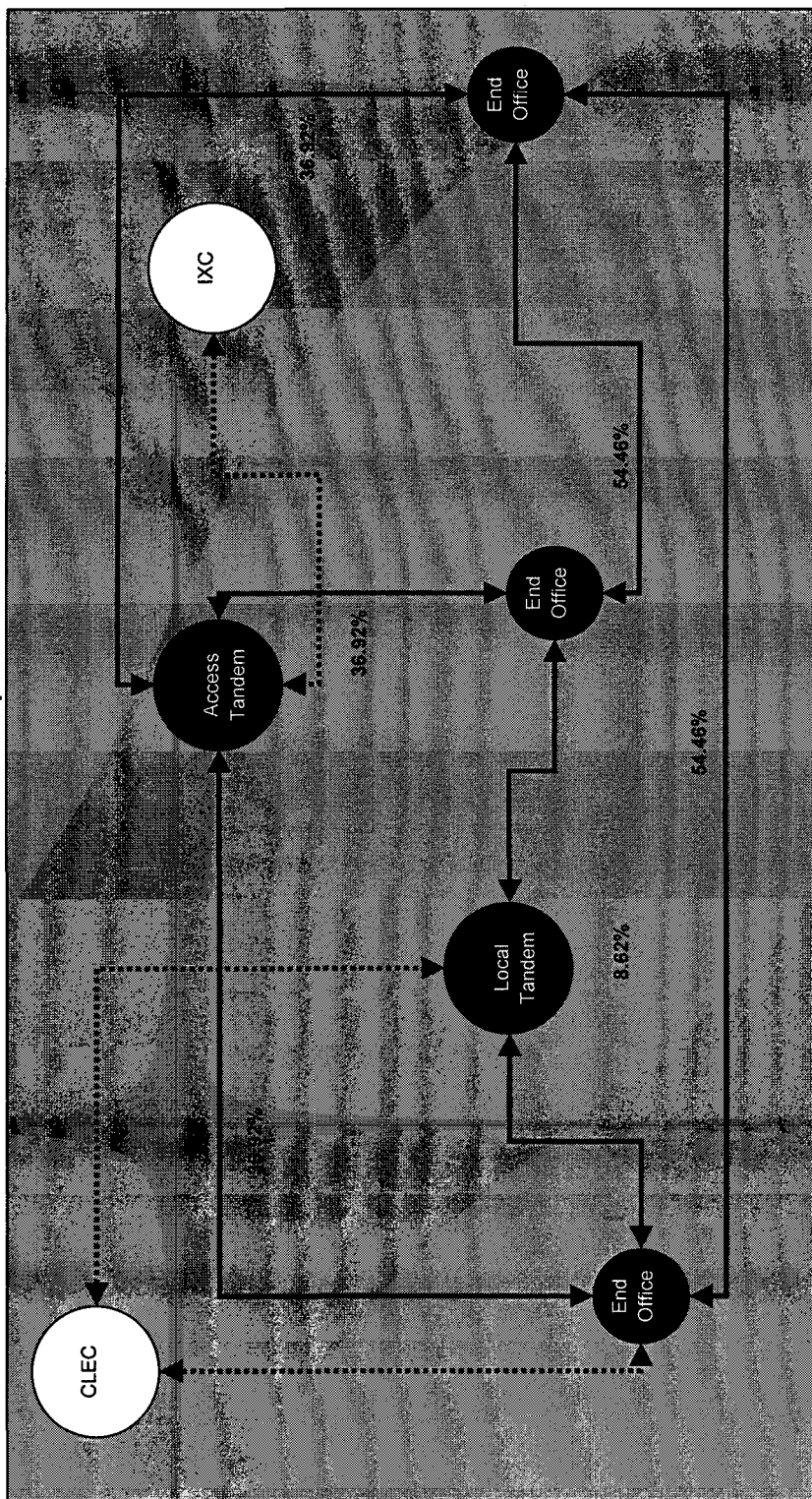
² Straight average of Originating and Terminating rates

³ Added switching function and trunk port elements

Switch	AZ Minutes
Transport	2,470.00
	1,270.00

EXHIBIT C

Shared Transport



Shared Transport Consist of 3 elements, they are:

- End Office to End Office and occur 54.46% of the time ;
- End Office to Local Tandem and occur 8.62% of the time ;
- and End Office to Access Tandem and occur 36.92% of the time.

IXC(s) are depicted in the above drawing and may connect to the Access Tandem (This is not Shared Transport)
 CLEC(s) have also been depicted in the above drawing and may connect to Local Tandems or End Offices (This is not Shared Transport)
 Both IXC(s) and CLEC(s) connections are shown with dotted lines, while Shared Transport connections are shown with solid lines.

EXHIBIT D

Rate Comparison Including List of Unresolved Rates*, Docket T-00000-00-0194

	QWEST Pricing Proposal		Joint AT&T/Worldcom/XO Pricing Proposal		ACC Staff Pricing Proposal	
	Recurring	NRC	Recurring	NRC	Recurring	NRC
INTERCONNECTION						
Local Traffic						
End office call termination, per minute of use	\$0.002143		\$0.00121		\$0.00147	
Tandem Switched Transport						
Tandem switching, per minute of use	\$0.001589		\$0.00052		\$0.00059	
Tandem Transmission						
Over 0 to 8 Miles - Fixed, per mou	\$0.000456		\$0.000000		\$0.00048	
Over 0 to 8 Miles - per mile	\$0.000043		\$0.000000		\$0.00008	
Over 8 to 25 Miles - Fixed, per mou	\$0.000465		\$0.000000		\$0.00048	
Over 8 to 25 Miles - per mile	\$0.000021		\$0.000000		\$0.00004	
Over 25 to 50 Miles - Fixed, per mou	\$0.000448		\$0.000000		\$0.00048	
Over 25 to 50 Miles - per mile	\$0.000011		\$0.000000		\$0.00002	
Over 50 Miles - Fixed, per mou	\$0.000433		\$0.000000		\$0.00048	
Over 50 Miles - per mile	\$0.000004		\$0.000000		\$0.00001	
Local Tandem Switching						
DS1 Local Message Trunk Port	\$56.98	\$220.95	\$0.00	\$17.81		
DS1 Local Message Trunk Port - Disconnect				\$13.12		
Trunk Group - First Trunk		\$211.06				
Message Trunk Group - Each Additional Trunk						
DS1 Trunk Group-Each Additional Trunk-Per Order		\$24.49				
Per minute of use	\$0.002376		\$0.00052		\$0.00059	
Local Switching						
Local Switching - TELRIC Based Rates						
Analog Line Side Port, First Port	\$2.45	\$145.57	\$0.90	\$1.68	\$1.61	\$42.58
Analog Line Side Port, Each Additional	\$2.45	\$95.75			\$1.61	\$42.58
Analog Line Side Port, Disconnect				\$1.57		**
Local Usage, per Minute of Use	\$0.002599		\$0.00121		\$0.00149	
Subsequent Order Charge		13.57				**
Digital Line Side Port (Supporting BRI ISDN)						
First Port and each additional port	\$10.56	219.37			**	**
Disconnect						
DS0 Analog Trunk Port						
First Port	\$15.78	\$123.11	\$0.90	\$1.68		\$42.58
Each Additional	\$15.78	\$28.57				\$42.58
Digital Trunk Ports						
DS1 Local Message Trunk Port	56.98		\$0.00	\$17.81	**	**
DS1 Local Message Trunk Port - Disconnect	\$15.78			\$13.12		**
Message Trunk Group, First Trunk	\$15.78					**
Message Trunk Group, Each Additional						**
DS1 PRI ISDN Trunk Port	\$228.78				**	**
DS1/DID Trunk Port	\$3.38				**	**